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to furnish an instance of the sort of change which must be recognized, a change which, so far from thwarting the ends of knowing, is the very instrumentality through which these ends are achieved. This change is the stone which the builders of philosophic theory have hitherto rejected, but which has promise of usefulness as head of the corner. Questions relating to the character of things antedating experience and to the nature of the change which they undergo in becoming experienced derive most of their terrors from the assumption of the "external standpoint" which was criticized above. "This doctrine of the real efficiency of thought does not teach that thinking undoes or reverses or blots out any thing or event that has happened. It insists only that in becoming known or entering into knowledge a past act is altered in the sense that it takes on additional functions or consequences."⁸ Similarly, the contents of a perceptual experience can hold membership in the physical order, because as experienced the objects of perception are construed with reference to their function of control. Every field of experience is thus dominated by a principle of organization, a "unique kind of centrality," in which both identity and change find a place. But it is not primarily to the cogency of this view so much as to its recognition of the character of the problem that I wish to direct attention. In view of the fact that the realist and the pragmatist hold so many conclusions in common, we may hope for a still more extensive agreement as the result of further reflection on the nature of consciousness and the "internal standpoint of experience."

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THE INFLUENCE OF FORM AND CATEGORY ON THE OUTCOME OF JUDGMENT

CONTRARY to the statement of logicians experiment has shown that judgments of similarity and of difference are not merely the two sides of one and the same act of intellect, but involve each its own peculiar psychological processes and criteria, and that the category or the form in which the judgment is expressed, the attribute toward which it is directed, makes a considerable and measurable difference in the outcome of that judgment. The present study reports an investigation, from a similar point of view, of certain other judgments commonly passed in daily life.

Is a judgment of stupidity the exact reverse of a judgment of in-

⁸ Moore, "Pragmatism and its Critics," pages 103-4.

telligence? Is a judgment of preference the exact reverse of a judgment of dislike? In other words, do we use the same standard in judging characteristics designated by logical opposites, ranking all specimens according to the degrees by which they deviate positively or negatively from that standard? When we arrange specimens of handwriting in an order of merit with respect to *resemblance* to a given standard hand we use somewhat different criteria from those employed when the specimens are arranged according to their *difference* from the standard. May it be also true that judgments of intelligence or of preference are based on different sets of criteria from those of judgments of stupidity or aversion? Do we like a person for certain qualities and dislike those who possess the exact antithesis of these qualities, or are our dislikes and preferences based on different sets of qualities? To discover which of these possibilities has the greater degree of probability is the main purpose of this study.

The material consisted of 25 photographs of actresses. The photographs were similar in shape, size, finish, and mount, differing only with respect to the individual photographed and the pose assumed. In selecting the photographs care was taken to avoid those of well-known actresses, in order that past judgments might not influence the results of the experiment. These pictures were ranked in an order of merit, by 10 observers, with respect to *preference*, *dislike*, *intelligence*, and *stupidity*. As the purpose was to discover the effect of the direction or category of judgment, special emphasis was laid on each category in the written instructions with which each of the observers was provided. These instructions were as follows:

PREFERENCE

Arrange the photographs in an order of merit, placing at the top the face you *like the most*, placing second the *face you like next best*, and so on, until the face you *like the least* is at the bottom of the series.

DISLIKE

Arrange the photographs in an order of demerit, placing at the top the face you *dislike the most*, placing second the one you dislike next intensely, and so on, until the one you *dislike the least* is at the bottom.

INTELLIGENCE

Arrange the photographs in an order of merit with respect to the *intelligence* of the face, putting at the top the *most intelligent*, next to it the next in intelligence, and so on, with the *least intelligent* face at the bottom of the series.

STUPIDITY

Arrange the photographs in an order with respect to the *stupidity* of the face, putting the *most stupid* at the top, next to it the next stupid, and so on, until the *least stupid* looking face is at the bottom of the series.

Five of the observers made the arrangements in the following order:

- 1st week, ranked for preference and intelligence.
- 2nd week, ranked for preference and intelligence.
- 3rd week, ranked for dislike and stupidity.
- 4th week, ranked for dislike and stupidity.

The remaining five ranked for dislike and stupidity in the first two weeks, and for preference and intelligence in the last two weeks. This precaution was taken in order to minimize the influence of practise on the results of the group averages. In every case at least a week intervened between one judgment and the next. There was no clear evidence of decided memory effect except in the case of the extremes of the series. After the fourth arrangement the observers were asked to write out a statement of the criteria used in judging each trait. The observers were all students of Barnard College, juniors or seniors taking their second or third year's work in psychology.

In making the correlations to be discussed later, the formula

$$r = 1 - \frac{6(\sum d^2)}{d(d^2 - 1)}$$

was used. The correlations were worked out between each observer's two trials (I. and II.), and between each observer's average judgment (*a*) with the group judgment (*A*), for each of the four traits. These results are given in Table I.

TABLE I
THESE COEFFICIENTS OF CORRELATION ARE ALL POSITIVE

Observer	Ell.	Car.	Ste.	Hal.	DeN.	Str.	Bro.	Bar.	Val.	Cas.	Av.	M. V.
Correlations of I. and II.												
Preference.....	55	73	87	91	68	74	88	92	84	96	80.8	10.6
Dislike.....	57	89	86	98	87	73	84	70	86	60	79.0	11.0
Intelligence.....	71	84	90	92	78	74	86	77	91	83	82.6	6.0
Stupidity.....	77	85	89	87	83	72	73	65	82	86	79.9	6.5
Correlations of <i>a</i> with <i>A</i> :												
Preference.....	51	57	58	23	56	55	44	45	54	58	50.1	7.7
Dislike.....	50	59	64	31	43	27	57	48	63	48	49.0	9.6
Intelligence.....	32	29	32	48	43	41	32	59	26	30	37.2	8.4
Stupidity.....	54	57	55	52	62	46	62	36	42	36	50.2	8.2

Table II. gives the correlations between each order and the reciprocal of its supposed opposite (by the reciprocal is meant the inverted order, so that what was originally the bottom of the series becomes the top). If categories logically opposite are also psycho-

logically the two sides of the same act of intellect, then the correlation between preference and the reciprocal of dislike should be equal to the average of the personal consistency coefficients for preference and for stupidity. That is to say, the inverted order for dislike should coincide with the direct order for preference, and should correlate as closely with this direct order as would two trials for preference with each other. The same relation should be expected to hold between intelligence and stupidity. On the other hand, if the processes differ from each other psychologically, it would seem that the correlation between preference and the reciprocal of dislike (both standards or categories being involved) should be less than the correlations of two trials for preference or of two trials for dislike. The same, again, should hold for intelligence and stupidity.

TABLE II

Observer	Ell.	Car.	Ste.	Hal.	DeN.	Str.	Bro.	Bar.	Val.	Cas.	Average
Correlations of:											
1. Pref. and the recip. of disl.	60	89	93	94	90	57	86	78	89	83	81.9
2. Av. of pref. I. and II., and disl. I. and II.	56	81	86.5	94.5	77.5	73.5	86	81	85	78	79.9
3. Int. and the recip. of stup.	85	79	93	90	94	74	73	87	86	96	85.7
4. Av. of int. I. and II., and stup. I. and II.	74	84.5	89.5	89.5	80.5	73	78.5	71	86.5	84.5	81.2

At first glance, as the results are presented in this table, the situation does not seem to be similar to that found in the study of judgments of *similarity* and *difference*. In 6 of the 10 cases the correlation between preference and the reciprocal of dislike is greater than the average correlations of similar arrangements, and in two of the remaining cases there is no difference between the two. The average shows a small per cent. in favor of the former.

In the case of intelligence and stupidity, 7 of the 10 observers have higher correlation between the judgment of intelligence and the reciprocal of stupidity than the average correlation of similar arrangements, and the average shows superiority in this direction of 4.5 per cent.

It is apparent then that if these character judgments really have the same psychological differences as those found between judgments of similarity and difference, some factor is present in this experiment which obscures the difference.

Table III. indicates that this factor is practise, adaptation, or familiarity with the material, and that before these factors operate genuine psychological differences are disclosed. In this table the trials are not averaged as in Table II., but the first order for preference is correlated with the reciprocal of the first order for dislike,

and the second order for preference with the reciprocal of the second order for dislike. In a similar way are handled the arrangements according to intelligence and stupidity. Each of these indirect correlations is then compared with the average of the direct correlations,—that is, with the average of preference with preference, and dislike with dislike. This also is done in the case of intelligence and stupidity.

In both cases the results are clear. The correlation of the first of the positive quality with the reciprocal of the first of the negative quality is less than the average correlation of positive and negative qualities with themselves. In the case of preference and dislike there is no exception to this rule, and the average difference amounts to over 13 per cent. In the case of intelligence and stupidity 3 of the observers are exceptions, but the other 7 show the difference clearly; a difference which averages, for the 10 observers, over 5 per cent. Averaging the two types of judgment, in the lower part of the table, there is no exception to the rule, and the average superiority amounts to over 9 per cent.

TABLE III

Observer	Ell.	Car.	Ste.	Hal.	DeN.	Str.	Bro.	Bar.	Val.	Cas.	Average
Av. pref. (I. and II.) and disl. (I. and II.)	56	81	87	95	78	74	86	81	85	78	79.9
Pref. I. and recip. of disl. I.	22	81	83	91	66	43	77	56	80	67	66.6
Pref. II. and recip. of disl. II.	59	80	90	95	92	55	79	86	82	90	80.8
Av. int. (I. and II.) and stup. (I. and II.)	74	85	90	90	81	73	79	71	87	85	81.2
Int. I. and recip. of stup. I.	72	78	88	88	87	53	52	73	77	92	76.0
Int. II. and recip. of disl. II.	83	78	88	90	91	69	86	84	83	87	83.9
Av. pos. and neg. (I. and II.)	65	82	88	92	79	73	82	76	86	81	80.5
Pos. I. and recip. of neg. I.	47	80	86	90	77	48	65	65	79	80	71.3
Pos. II. and recip. of neg. II.	71	79	89	93	92	62	83	85	83	89	82.3

The influence of practise, adaptation, and familiarity with the material is shown by comparing the third row of coefficients in each group of Table III. with the second row of the same section. In these third rows the correlation of the second direct arrangements with the second of the reciprocal arrangements is seen to move up, in each case, and very clearly in the average, to the correlation of two direct arrangements for a given trait. In fact the coefficients are usually a little higher. Very evidently, then, in the beginning of the experiment, before the two categories have been brought together in the consciousness of the observer in any explicit way, the judgment of a negative quality is not the exact antithesis of that of a positive quality. A judgment of dislike, that is to say, is not merely

the reverse aspect of a judgment of preference, but a new kind of judgment, with perhaps different criteria, and certainly with a different outcome. The same must be said of judgments of intelligence and stupidity. The form of expression, the direction or category of the judgment, has a measurable influence on the outcome of that judgment. But as the experiment proceeds and the two categories are both explicitly brought to the consciousness of the observer, and after practise, adaptation and familiarity with the material have played their part, the difference between the two categories tends to fall away, and the form or direction of the judgment no longer influences its outcome.

This tendency is the same as that remarked in the study of the judgments of similarity and difference in the case of handwriting, where it is found that with practise and repetition the two judgments come to resemble each other, and the inverted order for *difference* to agree more closely with the direct order for *similarity*.

This tendency is further shown by the figures in Table IV., in which the correlation of the first two trials of a given observer is compared with the correlation of his last two trials, regardless of the category of judgment concerned. With a single exception the latter coefficient is always higher than the former, the average of the ten observers showing a superiority of 7 per cent.

TABLE IV

Observer	Ell.	Car.	Ste.	Hal.	DeN.	Str.	Bro.	Bar.	Val.	Cas.	Average
First two trials	63	79	89	92	73	73	79	68	84	73	77.0
Last two trials	67	87	88	93	85	74	87	85	88	90	84.2

TABLE V

PERSONAL CONSISTENCY COMPARED WITH GENERAL JUDICIAL CAPACITY

Observer	Ell.	Car.	Ste.	Hal.	DeN.	Str.	Bro.	Bar.	Val.	Cas.	Average
Average correlations of I. with II.	65	83	88	92	79	73	83	76	86	81	80.6
Average correlations of a with A.	47	51	52	39	51	42	49	47	46	43	46.6

TABLE VI

Ratio of Best to Poorest	Preference	Intelligence	Dislike	Stupidity	Average
Correlation of I. and II.	96:55	92:71	98:57	89:65	1.51:1.00
Correlation of a with A.	58:23	59:26	64:27	62:36	2.15:1.00
Average.					1.83:1.00

TABLE VII

Correlations of			Averages of		
I. and I.:					
Preference	80.8	10.6	Subjective judgments .	78.9	10.8
Intelligence	82.6	6.0	Objective judgments ..	81.3	6.2
Dislike	79.0	11.0	Positive judgments ..	81.7	8.3
Stupidity	79.9	6.5	Negative judgments ..	79.4	8.8
a with A:					
Preference	50.1	7.7	Subjective judgments .	49.5	8.6
Intelligence	37.2	8.4	Objective judgments ..	43.7	8.3
Dislike	49.0	9.6	Positive judgments ..	43.7	7.9
Stupidity	50.2	8.2	Negative judgments ..	49.6	8.9

The introspection was of little value, consisting for the most part of mere generalization. But where specific criteria were given the presence of the two standards was apparent. For example, Observer Hal.—“I like eyes looking straight at me. I don’t like head or eyes to have unnatural pose, because it looks affected. I can’t abide frowsy hair. I like smiling eyes and mouth and a high forehead.” Here the first two criteria do seem to be opposed—eyes looking straight at one are not usually eyes in an unnatural pose. But other criteria show the two standards. The observer “can’t abide” frowsy hair, but she does not specifically admire smooth coiffures. She likes high foreheads, but expresses no positive dislike for low ones.

Some incidental points brought out in the results are worth noting. In Table V. the personal consistency of each observer is compared with her correlation with the group average. The coefficient (.06) shows that there is absolutely no correlation between the two. This seems to indicate an absence of general judicial capacity.

In Table VI. the ratio of best to poorest is given, and the familiar ratio of about 2:1 found.

Table VII. seems to show that the more subjective judgments of preference and dislike are more variable and uncertain than the more objective ones of intelligence and stupidity. The coefficients are slightly lower on the average and the mean variations are larger. This is true whether personal consistency or judicial capacity is concerned. The coefficients for the negative judgments of dislike and stupidity also show a higher variability than do those of the positive judgments of preference and intelligence.

SUMMARY

1. Judgments which are grammatically opposite (as preference and dislike, intelligence and stupidity) involve, in the beginning of the experiment, psychological processes and criteria which are not

identical. The form, direction, or category of the judgment exerts a measurable difference on its outcome.

2. As the experiment proceeds the processes and criteria move to a common plane and the two types of judgment resemble each other more closely. This movement to a common plane is apparently the result of repetition, adaptation, and familiarity with the material, and of the fact that the two categories, hitherto implicitly distinct from each other, are now brought explicitly together in the consciousness of the observer.

3. The result of practise and familiarity with the material is to increase the personal consistency of the observer's judgments.

4. Introspection suggests different criteria for judgments which are grammatically or logically only two sides of the same intellectual act.

5. There is seen to be no correlation between personal consistency and agreement with the group average.

6. The ratio of best to poorest, in both these respects, is the familiar one of about 2:1.

7. Subjective judgments (of preference and dislike) are more variable and uncertain than the more objective judgments (of intelligence and stupidity).

8. The coefficients of "negative" judgments (dislike and stupidity) are more variable than those of the "positive" judgments (preference and intelligence).

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DISCUSSION

SOMETHING MORE ABOUT INVERSION: A REJOINDER

I AM much obliged to Dr. Karl Schmidt for his critical notice of my article on "Inversion."¹ He has added to the evidence that inversion is practically worthless. For note carefully what his equations prove. From "All A is B " he proves that *if* $\bar{A}$ exists, and *if* $\bar{B}$ exists, then the $\bar{A}$ which is also $\bar{B}$ exists. To put it in concrete terms, from "All men are mortal" he proves that if not-men exist and if immortals exist, then not-men who are also immortals exist. The inverse is a simple categorical proposition, "Some not-men are immortal." Dr. Schmidt succeeds only in proving a very complex, doubly-conditioned hypothetical conclusion. This difference between the real inverse and what he actually proves is probably one

¹ This JOURNAL, Vol. IX., page 232. My article is in Vol. IX., page 65.